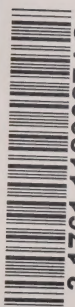


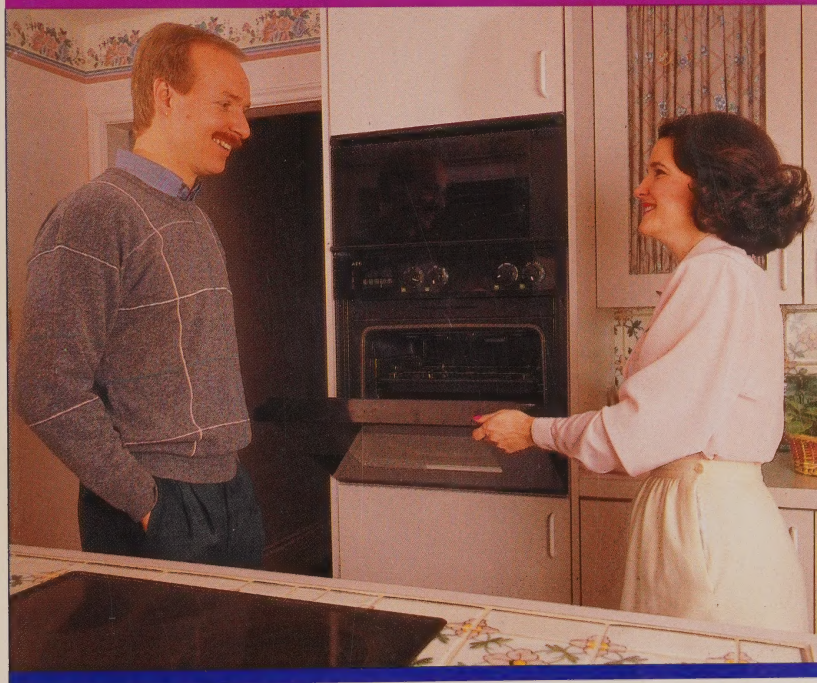
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CONSUMER'S GUIDE



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To Buying Energy-Efficient Appliances and Lighting




Ontario

Energy leadership

For economic strength

Ministry of Energy
Robert C. Wong
Minister



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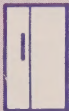
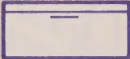




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Introduction

If you are thinking of buying a major appliance or new lighting products for your home, this booklet is for you. It will help you take energy use into account when making your purchase decisions. Appliances and lighting can consume up to 25 per cent of the total energy used in the home. By avoiding models and products that waste energy, and by choosing efficient alternatives, you can save yourself thousands of dollars in energy costs.

The illustration on this page shows how. For each appliance type, the figure indicates how many energy dollars can be saved during the life of the appliance, simply by choosing the most efficient model rather than the least efficient. Even if you sell the appliance before it reaches the end of its useful life, your energy cost savings will be impressive.

Energy-efficient appliances and lighting bring other benefits as well. The more efficient products often offer better construction and advanced technology. Other benefits are specific to particular appliances. For example, energy-efficient dishwashers use less hot water, which means there will be more water left in the tank for other uses. The energy saving features on a dryer can actually prolong the life of your clothes, and certain energy-efficient features available on your kitchen range will

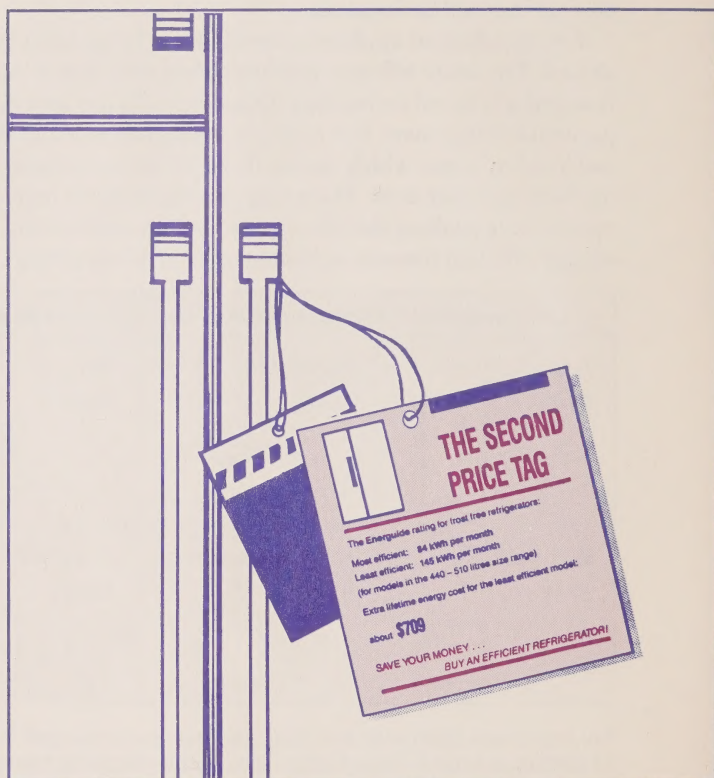
Lifetime Energy Savings for Most Energy Efficient Appliance		
Refrigerators \$709 	Freezers \$316 	Ranges \$135 
Dishwashers \$240 	Clothes Washers \$747 	Clothes Dryers \$148 

For each new appliance you buy, you can save yourself hundreds of dollars in total energy costs – simply by choosing the most efficient instead of the least efficient model. Over the life of all six major appliances, you can save over \$2000.

improve its cooking performance. In the case of lighting, energy efficiency means careful attention to the type of fixture purchased and to its location in the home – details which will provide energy savings and improved quality of lighting.

In short, the benefits of energy efficiency are significant. This booklet will tell you how to obtain these benefits when buying any of the six major household appliances: refrigerators, freezers, ranges, dishwashers, clothes washers, and dryers. It will also guide you through some of the energy-efficient lighting options for your new home.

Remember: you will have to live with your new appliances and lighting for a long time. By choosing these products carefully, you can enjoy the benefits of energy efficiency for years to come.



The "second price tag" can be higher than the purchase price.

Efficiency and the Second Price Tag

Every appliance and lighting product you buy can be thought of as having two price tags. We are all familiar with the first – the purchase price. The second price tag is less familiar but just as real: it is the cost of the energy you need in order to use your new appliance.

If the purchase price is thought of as a down payment, then the second price tag can be thought of as a series of monthly installments that you must pay over the next 15 to 20 years, until the unit is replaced. Since the second price tag for each appliance can represent hundreds of dollars, it is clearly an important consideration when making your purchasing decision.

However, a low second price tag is not by itself sufficient reason to buy a particular appliance or lighting product. Make sure that the model you choose will meet your needs and has the features you require. Purchase price – the first price tag – will also be a factor. In many cases, efficient appliances cost no more than similar inefficient models, and they may even be less expensive. On the other hand, some efficient appliances *are* more expensive, and you will have to decide whether the extra cost is justified by the lower second price tag.

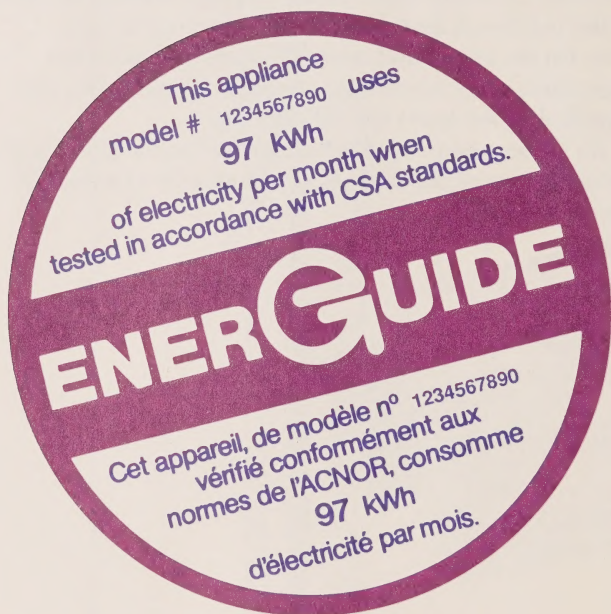
Look for the second price tags throughout this booklet. They will provide an idea of the impressive potential for savings with each type of appliance.

Energyguide

When comparing energy efficiency and calculating the second price tag for appliances, a key “tool of the trade” is the Energyguide label.

The Energyguide concept is simple. Using standardized methods, all models of refrigerators, freezers, dishwashers, ranges, clothes washers, and dryers sold in Canada are tested to determine their energy use. The results of these tests must be indicated on a label attached to every new appliance; the information is also published by Energy, Mines and Resources Canada in the *Energyguide Directory*.

All results are presented in kilowatt hours (kWh) per month. For instance, an efficient freezer might be listed as using about 45 kWh of electricity per month, while a less efficient unit in the same size range might use about 65 kWh/month. The lower the Energyguide rating, the more efficient the appliance.



The Energyguide label is your key to energy efficiency.

Calculating the Second Price Tag

Using the following simple formula, the Energuide rating for a given appliance can be used to calculate its second price tag:

$$\text{Energuide rating (kWh/month)} \times 12 \text{ months} \times \text{the appliance life in years} \times \text{local electricity costs (dollars/kWh)} \\ = \text{second price tag.}$$

Life expectancies vary from appliance to appliance, depending on use and other factors. Dishwashers usually last about 13 years; clothes washers 14 years; refrigerators 17 years; electric ranges and electric clothes dryers 18 years; and freezers about 21 years. Electricity prices can be obtained from your local utility, or you can use the Ontario average price of 5.7 cents per kWh, which is the figure used in calculating the second price tags in this booklet.

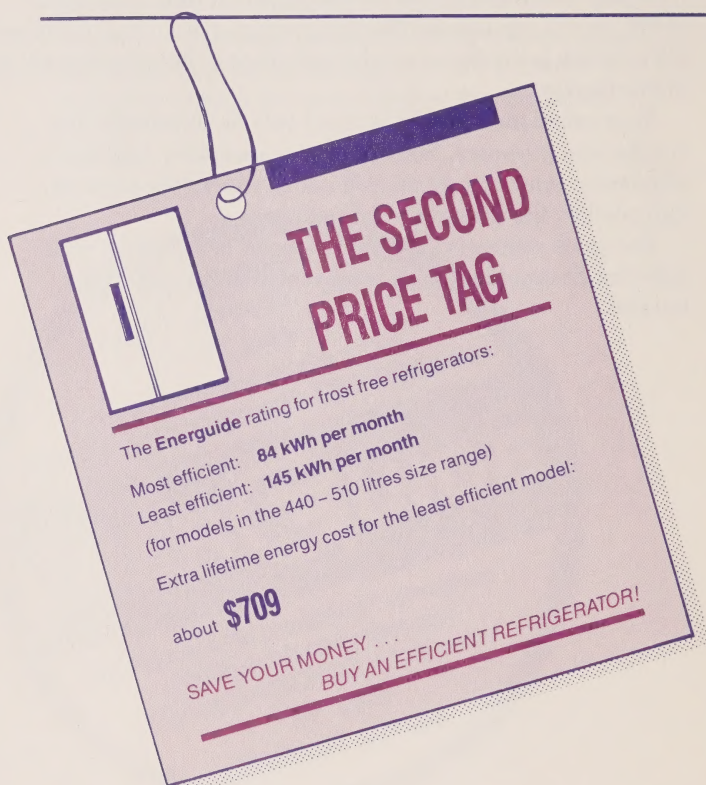
Your calculation should be used only as an estimate for comparison purposes. Since everyone uses their appliances differently, your energy use will not be exactly the same as indicated by the Energuide listings.

For quick reference, a table of second price tag costs for different Energuide ratings is presented at the end of this booklet.

Refrigerators

Apart from your furnace and hot water heater, the refrigerator is probably your home's biggest energy user.

Given this, it makes sense to buy an energy-efficient model. In the most popular size range, the most efficient model on the market in Canada requires only half the energy used by the least efficient models. This means that you can save hundreds of dollars simply by choosing an appliance with a low second price tag.



Buying an Energy-Efficient Refrigerator

The first step when buying an energy-efficient refrigerator is to select the right size for your needs.

Choosing the right size is important because the larger the refrigerator, the more energy it will use (all other factors being equal).

Refrigerator manufacturers list the capacity of their units in litres (L) or cubic feet (cu. ft.). The following size suggestions refer to the combined capacity of the refrigerator and freezer sections:

- *for 1 or 2 people, consider a refrigerator of about 340 L (12 cu. ft.)*
- *for 3 or 4 people, consider a unit of about 395 to 480 L (14 to 17 cu. ft.)*
- *for each additional person add 55 L (2 cu. ft.)*

These guidelines should, of course, be adjusted to match your lifestyle. If you eat out a lot you will need less space; if you are a gourmet cook you might need more.

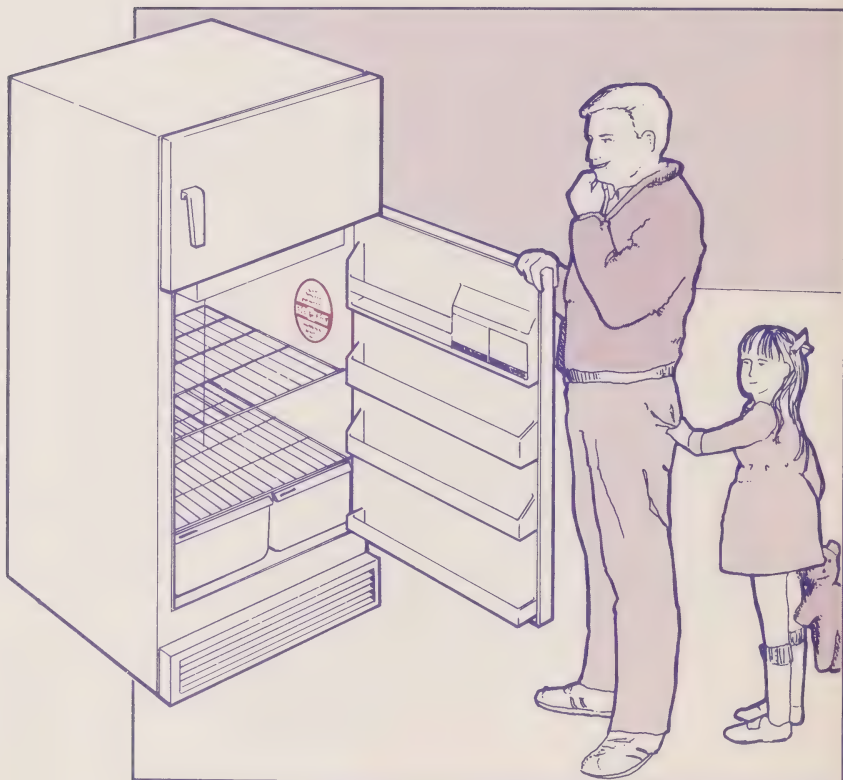
Buyers of new refrigerators often move the old unit to the basement and keep it running for the extra capacity it provides. Think twice before you do this; it usually takes a lot less energy to operate one large refrigerator than two smaller ones, especially if your old refrigerator is an energy guzzler.

The exterior dimensions of a refrigerator will also have an impact on energy use. Don't buy a unit that is too big to allow proper clearances on the sides, top, and rear once it's installed in your home. If sufficient clearance is not provided, the refrigerator may operate inefficiently. The owner's manual supplied by the manufacturer should provide recommendations.

Once you've chosen the size, the next step in buying an energy-efficient refrigerator is to compare **Energuid**e ratings. **Energuid**e labels are usually located *inside* the refrigerator.

Energy efficiency – and hence the **Energuid**e rating – is influenced by a number of factors, including the type of refrigerator. There are three major types sold in Canada:

- *units with a single door, in which the freezer compartment is located inside the fridge*
- *two-door units with a separate freezer compartment above (or below) the refrigerator compartment*
- *two- or three-door units in which the freezer compartment is beside the refrigerator compartment.*



Look for a refrigerator with the right capacity for your needs and a low **Energuid**e rating.

Units with side-by-side doors generally use the most energy, while one-door, manual-defrost models use the least. However, these rules of thumb can be misleading. For instance, some of the best two-door frost-free units use no more energy than a manual-defrost refrigerator. The only sure way to pick a low-energy model is to refer to the Energuide label.

There are also other features to look for when purchasing an energy-efficient refrigerator. For example, most refrigerators have heating coils just under the “skin”. These are intended to warm the outer surface of the unit near the door opening, in order to prevent condensation from forming. Some refrigerators have an “energy saver” switch that allows you to turn these heating coils down or off. Such a switch can save you money. As well, check whether the unit has wheels – a big help when it comes time to pull the refrigerator away from the wall to vacuum the coils.

Using Your Refrigerator

Once you’ve bought an *energy-efficient* refrigerator, there are some simple steps to follow to ensure that your energy bills are as low as possible.

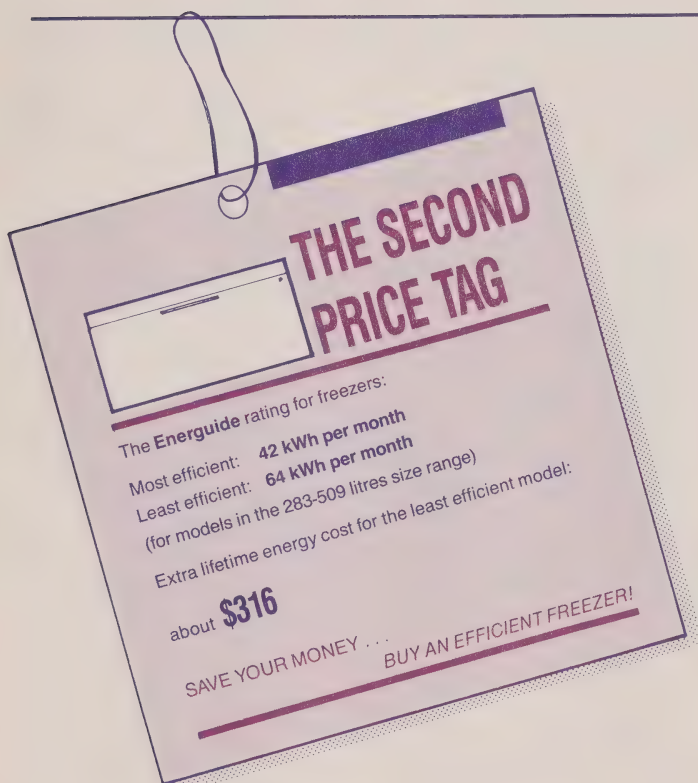
- **Location** — Try to locate the refrigerator away from heat sources such as a radiator, heat vent, stove, dishwasher, and direct sunlight. Your refrigerator’s job is to keep things cold: putting it close to a heat source only makes it work harder.
- **Temperature** — Use a thermometer to help you adjust the refrigerator to the proper temperature. The recommended temperature for the refrigerator compartment is about 3°C (37°F). For the freezer compartment, -18°C (0°F) is recommended for two- and three-door units. A temperature just 4°C (7°F) colder than necessary will increase the unit’s energy consumption by nearly 10 per cent!
- **Energy Saver Switch** — If your refrigerator has an “energy saver” switch, experiment with it to determine the setting that provides maximum energy savings without causing condensation on the outside of the unit. Since the appropriate setting can vary

at different times of the year, re-adjust the setting from time to time.

- ***Butter Conditioner*** — If your refrigerator has a butter conditioner, consider turning it off. The butter conditioner is actually a little heater, which makes your refrigerator work a bit harder to keep the rest of the food cold.
- ***Manual Defrost*** — If the refrigerator is a manual-defrost model, be sure to defrost it whenever 7 mm (1/4 in.) of frost builds up on the walls. Otherwise, the refrigerator has to work harder to keep the food cool, and the efficiency of the unit will drop.
- ***Door Opening*** — Don't open and close the refrigerator door unnecessarily, since it takes only a few seconds for cold air inside to spill out into the room.
- ***Thawing Food*** — Place frozen food inside the refrigerator to thaw. This will help keep the refrigerator cool and will save a little energy (especially compared to thawing in an oven or microwave, both of which require energy).
- ***Cooling Coils*** — Vacuum the coils on the back of the refrigerator at least twice a year (unplug the refrigerator first). These coils get rid of the heat that has been removed from inside the refrigerator. If they are covered with dust and grime the whole system works less efficiently. You can buy special appliance casters if your refrigerator doesn't have wheels.
- ***Door Seals*** — Check the seals on the refrigerator door occasionally. To do this, close the refrigerator door on a piece of paper and then try to remove the paper. If the paper is not held snugly in place, you should adjust the door or replace the seal. Be sure to check several places around the door.

Freezers

Some of the most energy-efficient freezers available anywhere are made in Canada. However, there are still some inefficient freezers on the market, so it pays to shop around.



Buying an Energy-Efficient Freezer

As with refrigerators, the first step when buying an energy-efficient freezer is to choose the right size for your needs.

Size is important because a freezer that is too big wastes energy. Most households don't need more than 130 L (4.5 cu. ft.) of capacity per person. A household that does not expect to make heavy use of the freezer, or has a large freezer compartment in the refrigerator, will require less.

The exterior dimensions of the unit are also important. Be sure the freezers you consider will fit into the space you have available, while still allowing for the necessary clearances on the sides and back. Without these clearances, the unit will not operate as efficiently as it should. Generally, clearances of 5 to 7 cm (2 to 3 in.) are required, but you should consult the owner's manual for details.

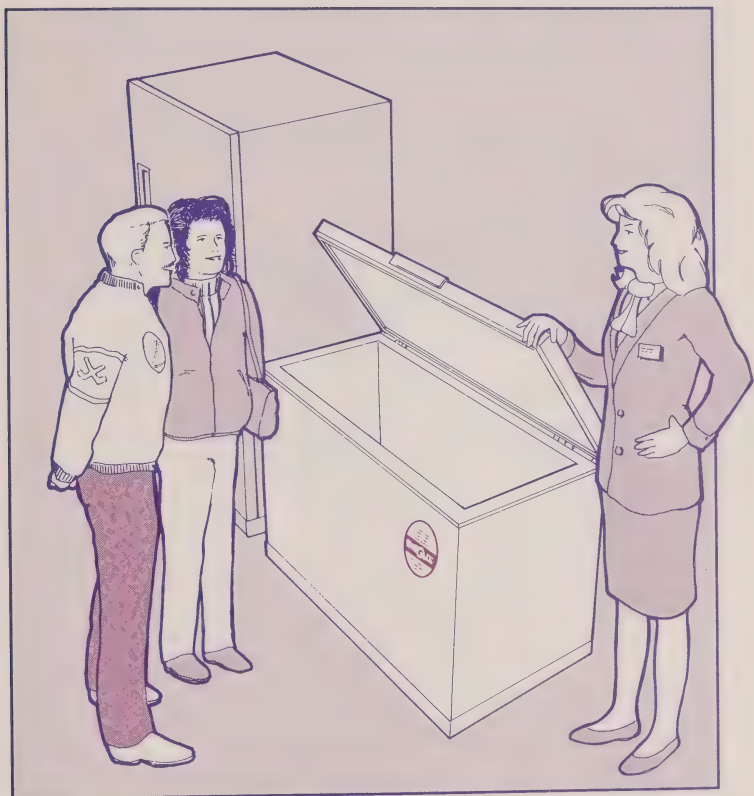
Once you have selected the appropriate size, the Energuide ratings will lead you to the most efficient models. Energy efficiency can be affected by such features as the amount of insulation and the type of freezer.

Two major freezer types are available in Canada: chest and upright. Chest freezers have the lid on top, whereas upright models resemble a refrigerator. Chest freezers almost always have manual defrost, because they only require defrosting about once a year. Upright models, on the other hand, are much more prone to frost, so some models are available with an automatic defrost feature.

Chest freezers are clearly the more energy-efficient option. With an upright model, some cold air will leak out around the door – and more will rush out whenever the door is opened. With a chest freezer, on the other hand, cold air tends to stay put inside. In addition, chest freezers are especially efficient compared to most frost-free uprights, since the automatic defrost feature is energy-expensive.

Using Your Freezer

How you use your freezer can greatly affect its energy consumption. Generally, the guidelines offered for refrigerators apply to freezers as well. The recommended temperature setting for the freezer is -18°C (0°F).



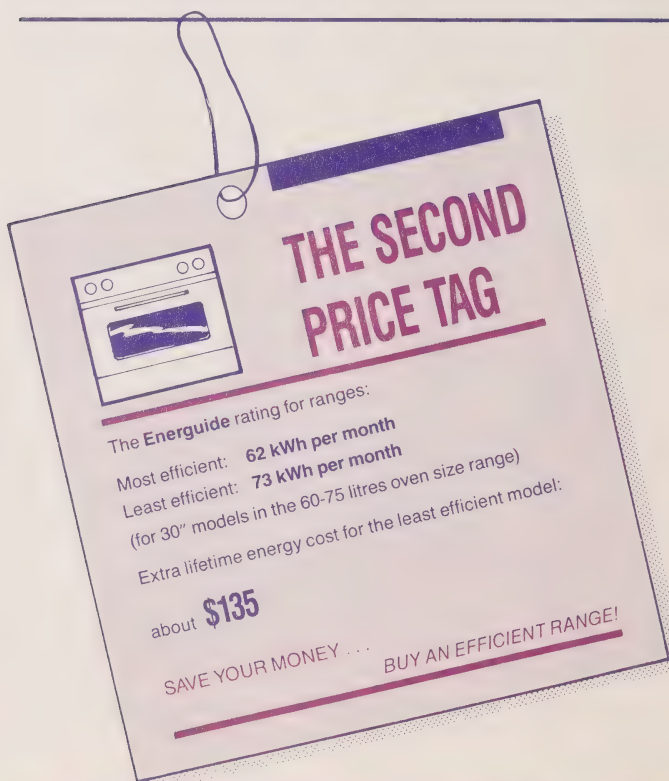
Chest freezers are much more efficient than upright models. They are available with up to 7.5 cm (3 in.) of foam insulation in the walls.

Ranges

The kitchen range, combining an oven with a four-burner "cooktop", is standard equipment in most Canadian homes. Until fairly recently, the biggest choice the buyer had to make was between a gas or electric unit.

Today, the choices confronting the buyer are much greater. Features such as self-cleaning ovens and solid element burners are now readily available. In addition, many models are available with the oven separated from the cooktop, allowing installation in different parts of the kitchen.

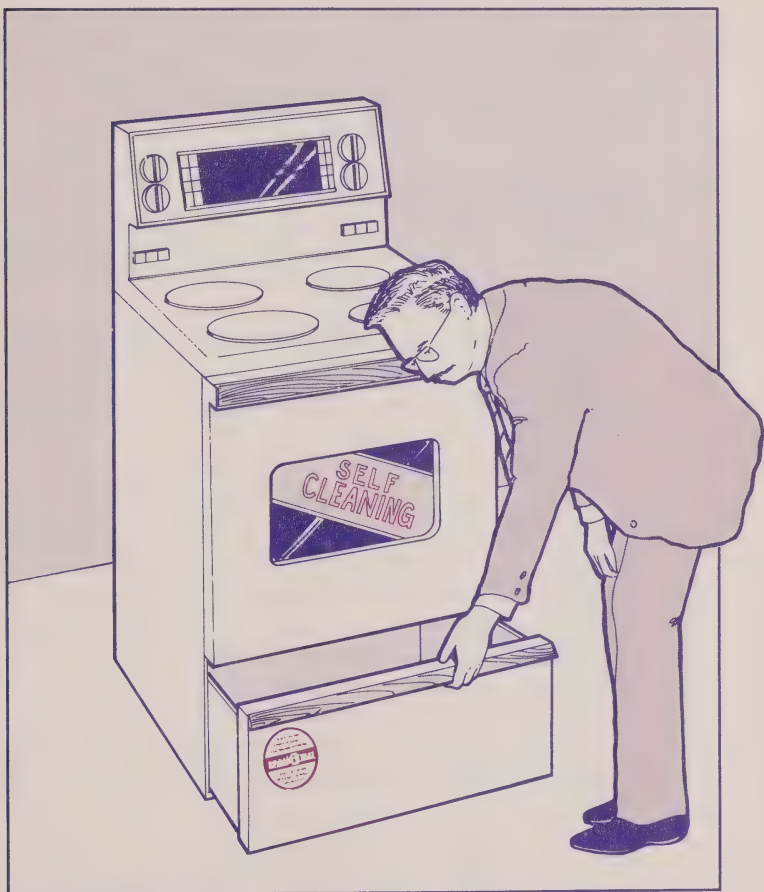
Since the basic technology is the same in most versions of the conventional range, the energy efficiency does not vary greatly from model to model. Even so, choosing one of the more efficient units can produce worthwhile savings, as indicated by the second price tag on this page.



Buying an Energy-Efficient Range

If you're buying an electric range, the Energuide rating is the key to choosing an energy-efficient model.

In comparing Energuide ratings, you may notice that there is little difference between the energy used by a regular oven and that used by a self-cleaning oven. This is because self-cleaning ovens are generally better insulated than regular ovens; though they use intense heat during cleaning, they also require less energy to cook your food. If you clean your oven only two or three times a year, you will likely save energy by buying a



Self-cleaning ranges can be as energy-efficient as regular models.

self-cleaning unit instead of an equivalent, regular oven.

Other features available in conventional ranges also affect energy use. For example, smooth surface cooktops (with burners under glass) require more energy than conventional burners. Cooktops with a built-in exhaust fan may also require more energy, but for a different reason. In winter, the powerful exhaust fans in these units may exhaust a good deal more heated air from your home than a standard range hood, which means that your furnace must work longer and harder to heat the home.

Since Energuide ratings are only available for electric ranges, it is difficult to compare the energy efficiencies of different gas models. Look for a unit that appears to be well built and well insulated. Be sure the oven door closes properly to minimize heat loss when the oven is on. Above all, look for a unit with an electronic ignition. The alternative – a pilot light – wastes energy by burning a small amount of gas at all times.

Other Technologies

In recent years, a number of other energy-saving products have come onto the market, including microwave ovens, convection cooking and induction cooktops.

Microwave ovens are now a common appliance in Canadian kitchens. Most are small counter-top units designed for use in conjunction with a conventional range. In addition, some conventional ranges offer a microwave feature.

Microwave ovens work by directing energy (in the form of microwaves) into the oven compartment. Almost all this energy is absorbed by the food. Instead of warming the oven and the air inside it, the energy is used to heat and cook your food. As a result, a microwave will use less than half the energy used by a standard range, for most cooking jobs. Savings will be greatest with small to medium quantities of food that would normally be heated in the oven.

Convection Cooking is also an energy saver. While small, counter-top convection ovens are available, conventional and microwave ovens with convection features are more common and efficient.

Like regular ovens, units with a convection feature require a heating element – but they also incorporate a fan that blows air around inside the unit. This ensures more even cooking tempera-

tures, resulting in excellent food quality. From an energy standpoint, the convection method means shorter cooking times at lower temperatures – which should add up to energy savings.

However, you should be aware that counter-top convection ovens are not always energy savers. Some models are poorly insulated compared to a conventional oven, so that they actually require more energy to operate.

On the other hand, the *convection feature* available on some conventional ovens **is an energy saver** (although the Energuide ratings do not show this, since the testing is done with the convection option turned off). Microwave ovens with a convection feature offer still greater energy savings for most cooking jobs. In fact, some people find these units eliminate the need for a conventional oven, although a separate cooktop is still required.

A final energy saving technology is the *induction cooktop* – a new product that uses magnetic forces to heat food or water in a pot. The food gets hot, but the surface of the cooktop does not. Induction cooktops can offer significant energy savings but they are very expensive. The extra cost cannot be justified on the basis of energy savings alone.

Energy-Efficient Cooking

The following tips will help you achieve even greater energy savings.

- Use the right appliance for the job. Small appliances are generally more efficient than a range. For example, an electric kettle uses about half the energy required to heat water on a cooktop. Similarly, a slow cooker can use up to 80 per cent less energy than would be required to cook the same food on the range. Naturally, if you have a microwave oven you can save a good deal of energy by using it instead of the conventional oven.
- Follow the manufacturer's instructions when using a microwave oven, in order to get maximum performance and avoid energy wasting problems like overcooking. Avoid using the microwave to defrost frozen food. With a little planning, you can save energy by defrosting many types of food in the refrigerator.

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- Preheating your oven is not usually necessary, except for baking. When you do need to pre-heat, 10 minutes is usually plenty of time to reach the required temperature.
 - Don't wait until the food is completely cooked before turning the oven off; turn it off a few minutes before the food is ready and let the heat in the oven finish the job.
 - If you have a self-cleaning oven, clean it only when necessary. This should be done right after cooking a meal to take advantage of the heat already in the unit.
 - Overcooking your food reduces its nutritional value and wastes energy. Opening the oven door to check progress also wastes energy. Look through the oven window whenever you can.
 - On the cooktop, be sure to use the right size pot for the element, and use lids that fit on the pots. Use as little water as possible when cooking vegetables. Better still, use a pressure cooker.
 - Keep the drip pans under conventional coil burners clean. Don't line the drip pans with aluminum foil – this may reflect too much heat and damage the element.
 - If you have a gas range, keep it in good running order. A yellow flame means it's time for a service call.

Dishwashers

About 80 per cent of the energy required to operate a dishwasher is used to heat water. The most efficient dishwashers, therefore, are the ones that use the least hot water.



Buying an Energy-Efficient Dishwasher

As with other appliances, Energuide is the best way to find out which dishwasher models are efficient, and which are not. But there are also other features to look for in an energy-efficient dishwasher.

First, be sure the models you are considering have a switch that allows you to turn off the electric-dry portion of the dishwasher cycle. Air drying is just as effective and requires no energy (although it does take longer).

You should also look for a dishwasher with a booster heater or “sani” setting that will bring the temperature of the incoming water up to about 60°C (140°F) – the operating temperature most manufacturers recommend. A booster heater will allow you to turn the temperature of your hotwater tank down to about 55°C (130°F), which will significantly reduce your household water heating costs.



Look for a dishwasher with a low Energuide rating and energy saving features like no-heat drying.

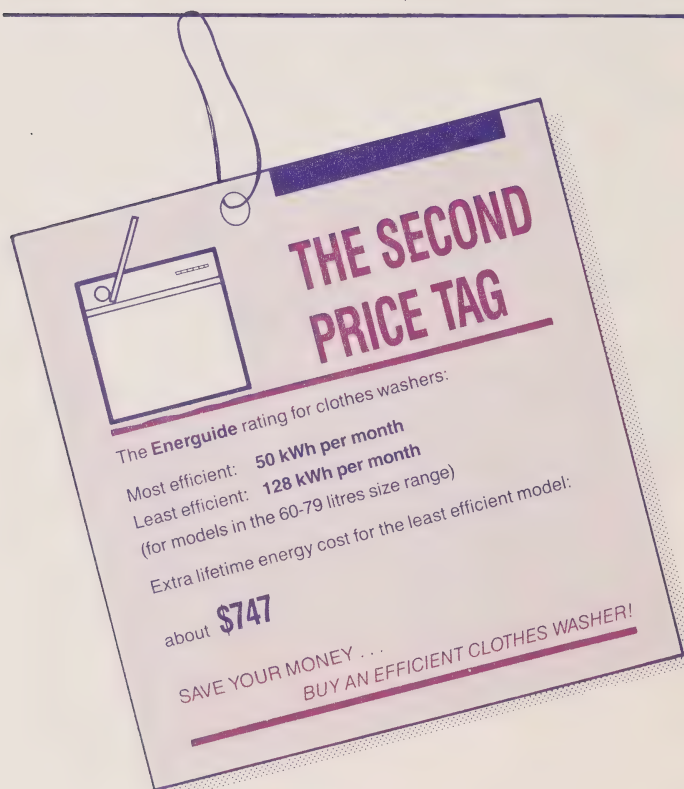
Using Your Dishwasher

An efficient dishwasher will provide direct energy savings, but you can save even more by using it wisely.

- Try to use your dishwasher only when it has a full load. If necessary, rinse the dishes by hand before loading in order to prevent food from drying and sticking on plates, pots, and pans.
- Experiment with the different cycles on your dishwasher. Short (“econo”) cycles often use less water (and energy) than the heavy duty cycles. Avoid using the plate warmer cycle; you can often warm plates in the oven using the heat left over from cooking the meal.
- Always let your dishes air dry: it works.

Clothes Washers

Like dishwashers, clothes washers require energy both for the machine's operation and for heating water. The most efficient clothes washers on the market today use less than half the energy of the least efficient units. By carefully considering the second price tag, you can assure yourself of hundreds of dollars in energy savings over the life of the appliance.



Buying an Energy-Efficient Clothes Washer

Checking Energuide ratings is the best way to find an energy-efficient clothes washer. The ratings take into account both the operation of the machine and hot water requirements.

Front loading washing machines generally use much less hot water than top-loading units, making them more energy-efficient. However, front-loading machines are not widely available in Canada.

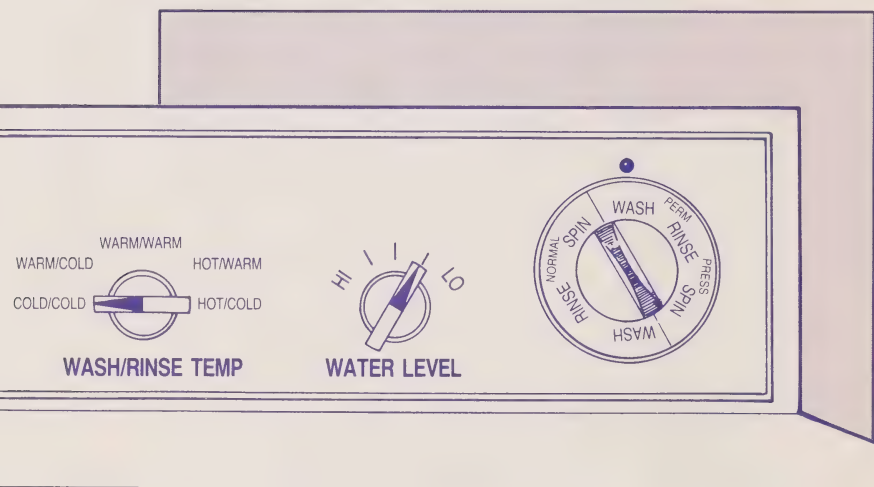


Front-loading washers use less energy than top-loading models, but are not readily available in Canada.

If you can't find a washing machine with a low Energuide rating, be sure to check the other features that will allow a less efficient unit to achieve low energy usage. Most importantly, be sure to buy a machine that has a cold wash and cold rinse option. By using this setting whenever possible, you can cut energy consumption to far below that indicated in the Energuide rating (which assumes that warm and hot water settings are frequently used).

You should also look for a machine with a water level control. This can be used to limit water use when you do a small load. Some washers are available with a special small load-basket, which saves even more water.

Compact clothes washers generally perform well in the Energuide ratings, because the energy cost per load is relatively low. Therefore, if you always do small loads, the compact machines can be energy savers. Otherwise, your total energy use will be higher with the compact units than with a full-size model, since you have to do many more loads to wash the same quantity of clothes.



A washer with a cold wash and cold rinse setting can save you a lot of money – if you use it!

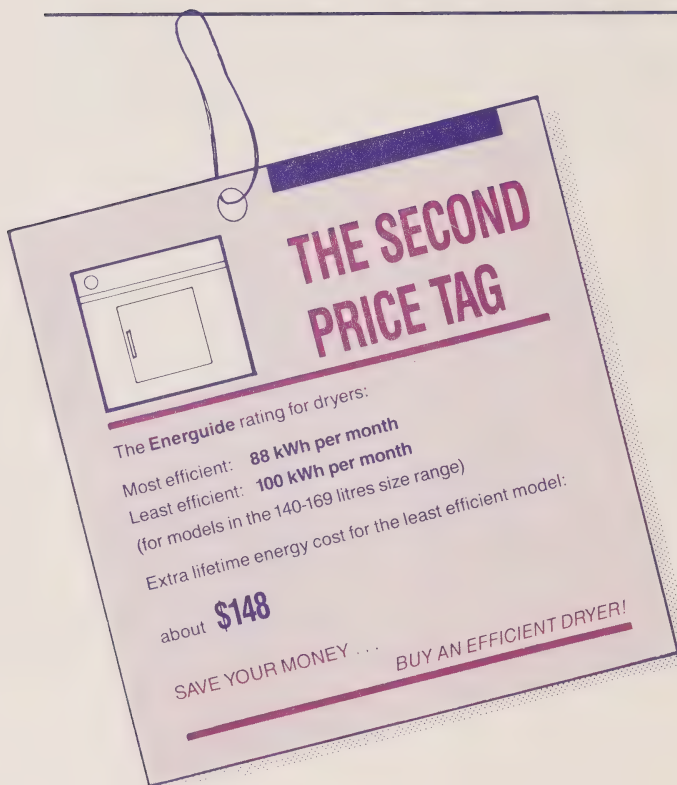
Using Your Clothes Washer

From an energy standpoint, how you use your clothes washer is probably as important as the choices you make when buying it.

- The key to low energy costs in clothes washing is to use as little hot water as possible. With modern detergents, you might be surprised to find how much of your washing can be done in cold water. Similarly, cold water rinse is always appropriate.
- There are more reasons than energy savings for using cold water. One or two loads using a hot water wash and warm rinse cycle will come close to draining the hot water tank – which won't please the next person who tries to take a shower!
- Whatever water temperature you use, wash full loads whenever possible. If a partial load is necessary, be sure to adjust the water level control.

Clothes Dryers

The energy efficiency of dryers varies less from model to model than some other appliances. Nevertheless, by considering the second price tag you can still realize savings in energy costs over the life of your machine.



Buying an Energy-Efficient Dryer

The best way to compare the energy efficiency of different electric dryers is to check Energuide ratings – but there are other features to look for as well. For example, many full size dryers have sensors that determine when the clothes are dry and trigger an automatic shut-off. Other dryers have an adjustable timer which shuts the machine off after a pre-selected period.



A low Energuide rating and automatic controls will cut the cost of operating your new dryer.

The problem with the latter is that you are likely to overestimate the length of time it will take to dry a load. As a result, the machine will continue to operate for several minutes after the clothes are dry – wasting energy and money and perhaps shortening fabric life and causing shrinkage. You can save energy *and* your clothes by choosing a dryer that shuts off automatically as soon as the clothes are dry.

Another feature to look for is a cycle that includes a “cool-down” period (sometimes known as a permastress cycle). No heat is supplied for the last few minutes of the cycle, so that cool air is blown through the tumbling clothes. The drying process continues and you save energy.

A compact dryer will probably use less energy per load than a full-size dryer, but each load dries fewer clothes. If you use your dryer only for small loads, a compact unit may be your best bet. However, for most users the full-size unit will have a lower second price tag.

If you intend to buy a compact, look for the same features as you would with a full-size dryer. If a machine does not have automatic controls, make sure the timer control allows you to select the exact drying time you require. Some units only provide for a few time settings.

Gas dryers are also available but are not rated by the Energiguide program. In comparing models, consider whether the unit has the automatic controls and cool-down features described above. In addition, look for models that have an electronic ignition rather than a pilot light; the former only burn gas while in operation.

Using Your Dryer

No matter how efficient your dryer is, you can save even more energy by using it wisely:

- **Avoid over-drying.** Use the automatic controls and select a setting short of bone dry (all fabrics have a natural moisture content). If you do not have automatic controls, experiment with the timer until you determine how long it takes to dry a typical load, then use this setting for most loads. Reduce the drying time for light loads.

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- If your dryer has a cycle with “cool-down”, be sure to use this setting.
 - Avoid partial loads whenever possible. Try to organize both your washing and drying so that you are always doing full loads.
 - Be sure to clean the filter in the dryer before every load, and be sure the vent to the outside is not obstructed (although it should have an automatic flap or damper on the outside to keep out cold winter air when the dryer is not operating).
 - Never vent your dryer indoors. This practice is extremely dangerous for gas dryers and is not recommended for electric dryers (due to the moisture, fibres, and chemicals in the dryer exhaust).
 - Finally, don't forget the outdoors clothes line – a low energy alternative to the dryer for anyone able to put up an outside line. Drying inside in the winter is not recommended because it can contribute to humidity and condensation problems.

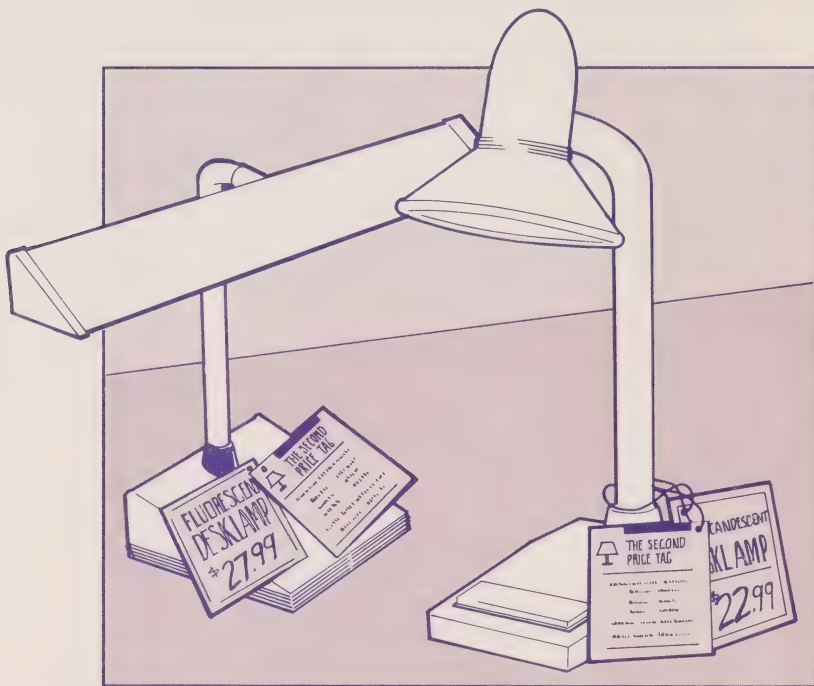
Lighting

There is a bewildering array of light fixtures and bulbs on the market today, many of which have changed dramatically in recent years. The choices you make when buying new lighting products can lower your energy bill. As with appliances, it is important to consider the second price tag of your lighting purchases.

Buying Energy-Efficient Fixtures

Most householders buy lighting fixtures from time to time, whether a simple desk lamp, updated lighting for the living room, or new fixtures for an addition to the home.

The first decision to make is how much light is actually required. A natural tendency is to provide too much light. You



Fluorescent fixtures may cost more to buy, but you will save on "the second price tag."

can avoid this by choosing fixtures that provide bright “task” lighting where needed, and lower levels of general lighting elsewhere.

The second decision is whether to purchase a standard incandescent fixture or a fluorescent fixture. With incandescent fixtures, a very small percentage of the electricity used actually becomes light. Fluorescent lights, on the other hand, are much more energy-efficient.

Traditionally, fluorescent lighting has had limited use in most homes; the older fixtures were big and the light quality was poor for most home needs. Today, however, new types of fluorescent tubes and bulbs produce light comparable to incandescent lighting, and a new generation of compact fluorescent bulbs and fixtures is available.

Fluorescent lighting can now be considered for almost any area of the home. The initial purchase cost may be higher, but the greatly reduced energy costs and the very long bulb life can make fluorescent fixtures a wise choice.

Whether you are buying incandescent or fluorescent, the choice of fixtures is wide – and so is the range of efficiencies that they offer. The following guidelines can help you choose the most efficient fixture for your needs:

- Look for fixtures that are specifically designed for the purpose you have in mind. For reading, choose a lamp that provides highly directional light. For general room lighting, choose a fixture that provides light over a broad area.
- A fixture with a single bulb gives more useful light than one with several bulbs having the same total wattage. For example, four 25-W bulbs give little more than half the light of one 100-W bulb (and one bulb is cheaper to buy than four).
- Avoid buying fixtures with features that limit light output. Heavy shades and bowls, for example, can reduce light levels significantly. Instead, look for features that will enhance useful light output, such as reflectors that direct the light outward.

Buying Energy-Efficient Bulbs

Over time, light bulbs and tubes burn out. When buying replacements, don't forget the second price tag. The 100-W incandescent bulb you buy for \$0.80 can cost you another \$5.70 in electricity costs before it has to be replaced.

If you are buying incandescent bulbs, your first energy saving step should be to choose lower wattage bulbs:

- Don't wait for the current bulbs to burn out. Whenever possible, reduce the wattage of the bulbs to the lowest level that provides acceptable light.
- Try 15-W or 25-W bulbs in your outdoor lights, in storage areas, and in other places where bright light is not required. You may find that these low wattages do the job well.
- In fixtures with two bulbs, try removing one. If necessary you can slightly increase the wattage of the remaining bulb, but not above the maximum rated wattage indicated on the fixture. For safety reasons, you may want to screw a burnt-out bulb into the empty socket.

When buying standard incandescent bulbs, it is desirable to buy energy-efficient brands. Unfortunately, bulbs are not sold with the lumens per watt indicated (see "Lumens and Watts", pg 33), so it is difficult to know which brands are most efficient. "Energy saver" incandescent bulbs use lower wattage (which saves energy and gives less light) but they are not necessarily more *efficient* than regular bulbs.

Long-life bulbs are sometimes confused with energy-efficient bulbs; most are actually less efficient than a standard incandescent. Bulbs with a higher than normal voltage rating are also available (typically, 130V instead of the standard 120V). These are intended for use where the electric supply voltage fluctuates (as is the case in some rural areas).

Lumens and Watts

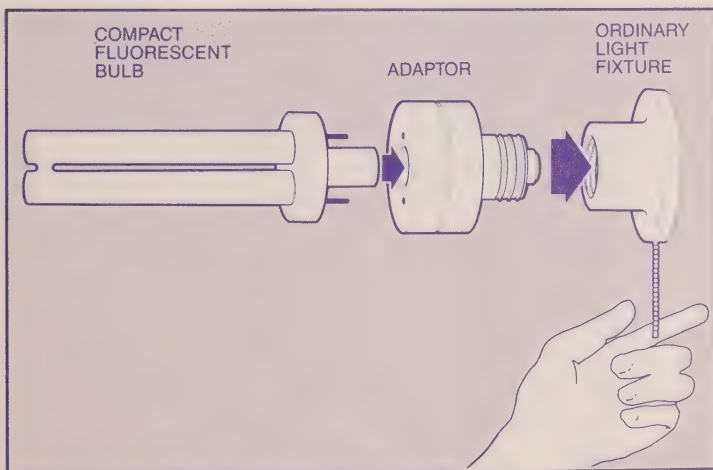
When buying light bulbs, most people think of “watts” as a measure of brightness. We know that a 100-W bulb provides a lot of light, whereas a 7-W bulb can serve only as a night light.

In fact, the watt is a measure of energy, not of light output. A 40-W bulb uses 40 watts of electricity no matter what type of bulb it is. But the amount of light produced will vary depending on the bulb type.

Light output is measured in “lumens.” A standard 40-W bulb produces about 450 lumens, whereas a 40-W fluorescent tube produces about 2150 lumens – nearly five times as much light!

There is an alternative to replacing one incandescent bulb with another. Fluorescent bulbs are now available for use in incandescent fixtures. For example:

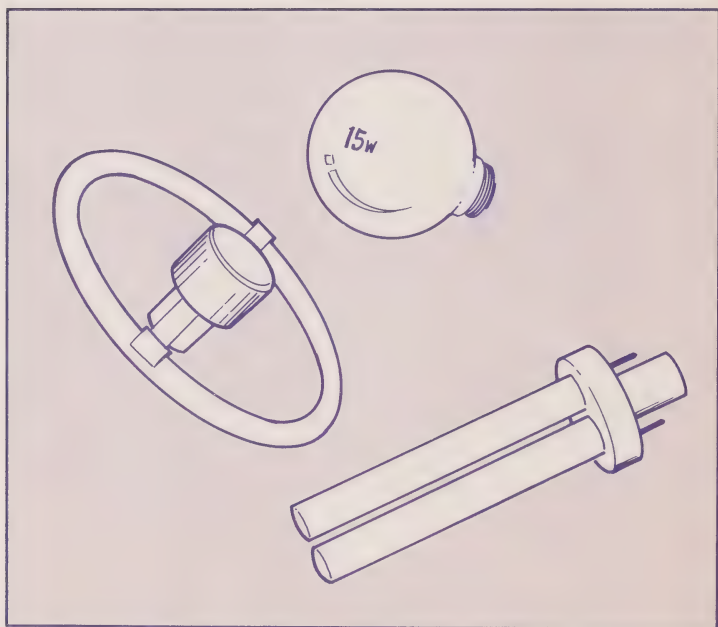
- Compact fluorescent bulbs can use 70 to 80 per cent less energy than a standard incandescent. A 13-W compact fluorescent can be used in place of a 60-W incandescent, and lasts about 10 times longer. Some products screw directly into the socket; others require an adaptor. Because the fluorescent bulb is slightly longer than a standard incandescent, check whether it will fit in your fixtures before buying.



Compact fluorescent bulbs use 70 – 80% less energy than standard light bulbs, and last 10 times as long.

- Circular fluorescent tubes with adaptors that allow them to be screwed into incandescent fixtures are also available. These bulbs have a long life and can provide approximately 50 per cent energy savings.

Although these products are well proven, they are relatively new and may be hard to find in some areas. Check at lighting specialty stores and stores that carry a wide selection of lighting products. The purchase price may seem high until you consider the second price tag. For lights that are used a great deal, the over-all cost (purchase price and ongoing energy costs) can be attractive. (See “Dollars and Cents” – sample calculation, pg 35).



Compact fluorescent, circular fluorescent, and low wattage bulbs can all save energy.

Dollars and Cents

In many cases, you can reduce the amount of energy consumed by your home's lighting at no cost, by turning lights off and using low wattage bulbs and task lighting. Where you do have to spend money, the payback through energy savings will often make the expense worthwhile. Consider the following example, which compares the cost of replacing a 60-W incandescent bulb with a 13-W compact fluorescent:

	<i>Incandescent</i>	<i>Compact Fluorescent</i>
The first price tag (purchase price for 10,000 hours of light)	\$ 8 (for 10 bulbs)	\$25 (for reusable adaptor and 1 bulb)
The second price tag (energy cost for 10,000 hours of light, at 5.7 cents per kWh)	\$34	\$ 9
Total Cost	\$42	\$34

Compact fluorescents provide other benefits as well. For instance, these bulbs require changing only once for every 10 times an incandescent bulb is changed – a real advantage in hard-to-reach areas. Also, a compact fluorescent won't get as hot as an incandescent bulb, which can sometimes be an advantage (as in the case of recessed light fixtures in some locations).

Where you already have fluorescent fixtures in the home, you have energy-efficient lighting. But you can still make improvements. When buying replacement tubes, ask for the special, extra-efficient type. A standard, four-foot (1.2-metre) fluorescent tube uses 40 watts, while the energy-efficient variety uses only 34 watts. These don't always fit old fixtures, so be sure to take along the number of the old tube to avoid a mismatch.

More Ways to Save Energy in Lighting

Apart from buying efficient fixtures and bulbs, you can save energy by following these steps in lighting your home:

- Install solid state dimmers so that you can vary the light levels in a room to match the need. This saves energy and extends bulb life.
- Consider installing other devices that save energy, including timers that automatically shut lights off after a set period of time, and photocells that turn nighttime security lights off during the day.
- Avoid having a single switch controlling too many lights; this means that you will have lights on where you don't need them.
- Keep your lamps and fixtures clean. Dirt cuts down light levels – which can lead to extra lights being switched on or higher wattage bulbs being used. When cleaning, unplug the fixture or turn the power off.
- When redecorating, remember that white walls and ceilings will reflect about 80 per cent of the light that strikes them, whereas black surfaces reflect only about 10 per cent of the light. In other words, you will need brighter lights in a room with a dark decor than in a room with white surfaces.
- Above all, turn lights off when they are not in use. Contrary to popular belief, this will save energy even if you are out of the room for a very short time.

What to do if...

Buying an efficient appliance or lighting product isn't difficult but problems can arise. These can usually be overcome.

What if...the retailer has a very limited choice? Shop around. There is a lot of choice on the market and you should be able to find an efficient product.

What if...some appliances are not labelled? All new refrigerators, freezers, ranges, dishwashers, clothes washers, and dryers sold in Canada are required to display the Energuide label. If you are interested in an appliance that is not labelled, ask why not. You can also ask to see a copy of the *Energuide Directory*, which provides ratings for all models on the market in Canada. If the store doesn't have the directory, you can contact Energy, Mines and Resources Canada at the address listed at the end of the booklet (see "For More Information").

What if...the salesperson says the Energuide ratings are meaningless? The salesperson is misinformed. Your energy consumption may not precisely match the Energuide rating because of the way you use your appliance. But Energuide is not intended to help you predict exactly what your energy use will be. It is meant to help you compare appliances – and it does this very well.

What if...you are buying a used appliance? The energy efficiency of most major appliances has improved significantly in recent years. In comparison, many of the older, used appliances on the market are energy guzzlers.

Nevertheless, it should be possible to find a reasonably efficient used appliance. If the appliances you are looking at are less than 10 years old, they have probably been tested under the Energuide program. If the Energuide label is not still in place, you should be able to get ratings from an old *Energuide Directory*, available from Energy, Mine and Resources Canada (see "For More Information", pg 39).

Whether or not you can find the Energuide rating, be sure to check for the various energy savings features discussed for each appliance in this booklet. Make sure that the appliance has been well maintained and is in good running order. If not, you may

find yourself paying higher than necessary energy bills, not to mention the risk of expensive repairs.

If you can't find a reasonably efficient used appliance, consider buying a new one instead. The purchase cost will be greater but your savings on the second price tag might make up for the extra expense.

What if...you can't find a good selection of energy-efficient lighting products? Energy-efficient lighting can be hard to find. For maximum choice, your best bet is probably a lighting specialty store or a supplier of electrical equipment. If in doubt, check in the *Yellow Pages* under "Lighting Fixtures," "Light Bulbs and Tubes," and "Electrical Equipment Supplies."

If even the specialty stores don't have what you want, ask if they can order it. Special orders can often be filled quickly and easily.

For More Information

This booklet is one of a series of free publications aimed at helping consumers make informed decisions about home energy matters. Other booklets in this series include the *Consumer's Guide to Buying Energy-Efficient Windows and Doors* and *Consumer's Guide to Buying an Energy-Efficient Resale Home*. The Ontario Ministry of Energy also publishes the following booklets:

Where and How to:

- *Caulk and Weatherstrip*
- *Install Air-Vapour Retarders*
- *Insulate Basements*
- *Provide Fresh Air and Control Humidity in a Tighter House*
- *Insulate Cathedral Ceilings and Flat Roofs*
- *Improve Fireplace Efficiency*

*An Old Flame Rekindled –
A Guide to Residential Wood Heating.*

For free copies of these booklets, write to:

Ontario Ministry of Energy
Consumer Publications
56 Wellesley Street West, 9th Floor
Toronto, Ontario M7A 2B7.
Telephone in Toronto: 965-3246.
Outside Toronto: call toll-free, Zenith 80420.

Ontario Hydro and many municipal utilities also offer free energy advice and information to their customers, including the latest Ontario Hydro and government publications. These services provide you with home energy information to reduce costs and increase comfort.

For more information on the range of services available to you, call the telephone number on your hydro bill.

Finally, for a copy of the *Energuide Directory*, write to:

Energy, Mines & Resources Canada
Home Energy Information
580 Booth Street
Ottawa, Ontario K1A 0E4.

Top 10% Energy-Efficient Canadian-Made Appliances*

<i>Appliances</i>	<i>Features</i>	<i>Total Energy Consumption Range kW/h/month</i>	<i>Efficiency Range of Top 10% kW/h/month</i>	<i>Brand Names of Top 10%</i>	<i>No. of Models in Top 10%</i>
Dishwashers	Energuide type "C" 29 – 39 litres/cycle	83 – 110	83 – 86	Beaumont Danby Frigidaire General Electric Hotpoint Inglis Kelvinator Kenmore McClary Moffat Viking Whirlpool White-Westinghouse	17 4 12 25 11 18 8 7 6 10 2 8 11
Clothes Washers	Energuide Range 3, 4, 5 Tub capacity 60 – 79 litres	50 – 128	50 – 58	Beaumont	1

Clothes Dryers	Energuide type "A" Drum Capacity 140 - 169 litres	88 - 100	88 - 89	Admiral Frigidaire Ingls Kelvinator Kenmore Whirlpool White-Westinghouse	3 2 4 2 4 3 1
Refrigerators	Energuide type "D" 440 - 510 litres (15.5 - 17.9 cu. ft.)	84 - 145	84 - 90	Admiral Ingls Kenmore Whirlpool	4 5 6 4
Freezers	Energuide type "C" 283 - 509 litres (10.0 - 17.9 cu. ft.)	42 - 64	42 - 44	Danby Wood's	2 1
Ranges	All conventional models, 30" width, oven capacity 60 - 75 litres	62 - 73	62 - 63	Admiral Beaumont General Electric Hotpoint Ingls Kelvinator Kenmore McClary Moffat Viking Whirlpool White-Westinghouse	8 7 12 13 9 3 4 2 8 2 5 5

* Based on 1988/1989 *Energide Directory*

For Quick Reference

The following table can be used to give you a rough idea of the second price tags of the different appliance models you are considering buying. The numbers have been calculated as described in the section "Efficiency and the Second Price Tag," found at the beginning of this booklet.

Using the table is simple. For instance, if you are comparing two refrigerators with Energuide ratings of 90 and 120 kWh per month, the table indicates that the second price tag for the more efficient model will be \$350 less than for the other (\$1400 - \$1050).

The Second Price Tag

Annual and Lifetime Appliance Energy Costs		
<i>Energuide Rating</i>	<i>Approximate Energy Costs*</i>	
<i>(in kWh per month)</i>	<i>Annual</i>	<i>Lifetime (for an appliance that lasts 17 years)</i>
\$		\$ (rounded)
30	20.50	350.00
40	27.40	470.00
50	34.20	580.00
60	41.00	700.00
70	47.90	810.00
80	54.70	930.00
90	61.60	1,050.00
100	68.40	1,160.00
110	75.20	1,280.00
120	82.10	1,400.00
130	88.90	1,510.00
140	95.80	1,630.00
150	102.60	1,740.00

* Assuming electricity costs of 5.7 cents per kWh,
the Ontario average in early 1989.

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- Ontario Hydro.

Cette publication et d'autres publications sur l'efficacité énergétique des habitations sont disponibles en français. Pour des exemplaires, communiquez avec le ministère de l'Énergie de l'Ontario:

Publications destinées aux consommateurs
56, rue Wellesley ouest, 9^e étage
Toronto (Ontario) M7A 2B7.

À Toronto, au (416) 965-3246.

À l'extérieur de Toronto, appelez le téléphoniste sans frais et demandez Zénith 80420.